Effect Of Psychotropic Drugs On Aggression In A Prison Setting

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SUMMARY

The authors, working in a maximum security correctional institution, had noted an apparent increase in acts of aggression by inmates when these inmates were on psychotropic drugs. A retrospective study was therefore carried out to attempt to correlate and prove or disprove this hypothesis. It was found that violent, aggressive incidents occurred significantly more frequently in inmates who were on psychotropic medication than when these inmates were not on psychotropic drugs. Of these, antianxiety agents (diazepam in 81 percent of the cases), appeared to be most implicated, with 3.6 times as many acts of aggression occurring when inmates were on these drugs. For the other classes of psychotropic medication the aggressive incident rate was double the rate of those on no psychotropic medication.

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PSYCHOTROPIC DRUGS have been noted to affect human behavior in many ways: previous studies have indicated that the release of hostile aggression frequently follows from the use of some benzodiazepines. The release of hostility observed after the use of chlorpromazine, chlordiazepoxide and diazepam has even been implicated in some acts of murder and suicide. It is further hypothesized that people with a history of poor impulse control may have a predictable response when placed on these drugs. We therefore attempted to analyze this hypothesis in a markedly aggressive group of inmates in a federal maximum security institution.

Method

We define aggression as behavior directed towards removing or overcoming what is menacing the physical or psychological integrity of the living organism. It is also defined as behavior used to reach dominant rank in a socialized animal organization.[1,2]

In this study we focused on measurable overt acts of aggression which included fighting, assault against others or self, destruction of property or intentionally causing disturbances. We have also included verbal aggression, i.e. abusive language and threats. These overt acts of aggression were observed and reported by prison staff and had been authenticated by formal prison hearings before the study began.

Inmates were deemed to have an aggressive background on the basis of a study of confidential files which contained evaluations of the inmate by classification and psychiatric personnel as well as a history of their convictions and social background. These records also include offenses committed in prison authenticated by prison hearings and convictions. Crimes committed by those inmates in the study included murder, attempted rape, rape, attempted murder, indecent assault, armed robbery, robbery with violence, assault or wounding with intent.

The period studied was from December 1, 1972 to May 31, 1973 and an aggressive history during this time was considered to be one in which two or more offenses of an aggressive nature occurred. Offenses (see Table 1) were judged aggressive on the basis of descriptions of the

TABLE 1

Charges Under Which an Aggressive Incident Could be Listed

1. Disobedience of a lawful order from a penitentiary officer, e.g. refusing to leave an area when told.
2. Assault or threatened assault on another person.
3. Damage to government property or the property of another person, e.g. destroys cell.
4. Indecent, disrespectful or threatening actions, language or writing toward another person.
5. Willful disobedience of any regulation governing the conduct of inmates, e.g. willfully engages in known unlawful activity.
6. Possession of contraband e.g. uses dangerous weapons.
7. Any act calculated to prejudice the discipline or good order of the institution, e.g. creating a disturbance.

TABLE 2

Drug Classification

All high and low classifications are daily dosages

Drug	Unit (mg) <4 units = low, >4 = high
Anxiolytic	
Diazepam	5
Chlordiazepoxide	25
Hydralazine	50
Meprobamate	400
Antipsychotic	
Chlorpromazine	50
Thioridazine	50
Pericyazine	10
Methotrimeprazine	10
Trifluoperazine	2
Haloperidol	1
Perphenazine-amitriptyline	1-13
Antidepressant	
Imipramine	25
Amitriptyline	25
Sedatives and Hypnotics	
Methyprylon	300
Pentobarbital-carbromal	98-259
Methaqualone-diphenhydramine	250-.25
Secobarbital	10
Amobarbital-secobarbital	20
Glutethimide	50
Phenobarbital	20
Chloral hydrate	500
Furazepam	30

incident and the nature of the charge. They included mainly direct physical aggression, i.e. fighting, destruction of a cell or self-mutilation. Excluded from the group were those who suffered from chronic physical disease or injury, those who were not in prison for the full six months or those who had been found to be hoarding contraband medication or who were intoxicated or on medication from any non-medical source.

The selected group therefore had a history of aggressive behavior in the past and in the period studied. They were all males of varying origins, ranging in age from 18-50 years.

Prescription of Medication

Psychotropic medication is prescribed in the institution by the physician or the prison psychiatrist following interviews with the patient. Inmates receive medication at prescribed times and in prescribed dosages, from institution nurses who ensure the medications are taken as prescribed. If medication is refused, it is generally discontinued.

In many instances the physician or psychiatrist prescribes the medication on a cyclic basis, i.e. one week on, one week off, or some similar pattern, to discourage habituation. Exact records therefore existed for dosage and time periods on any medication ordered for a patient.

The psychotropic drugs were classified into four groups:

1. Antianxiety agents.
2. Antipsychotics.
3. Antidepressants.
4. Sedatives and hypnotics.

Dosage was also classified high or low (see Table 2). An inmate was considered to be on medication on the first day received and to be off it on the last day received.

Following documentation of the above records the following ratio was calculated for each inmate and then for the aggressive group as a whole: number of aggressive incidents per man day on psychotropic medication vs. number of aggressive incidents per man day not on psychotropic medication. This ratio enabled us to compare aggressive incidents in a group with an aggressive history to incidents occurring when participants were on or off psychotropic medication.

Findings

From a population of 375 inmates in the institution, 82 or 20 percent had a history of an aggressive background and of aggression in the period studied. Of this group, 28 inmates received some psychotropic medication during the time studied, 19 did not, and 35 were disqualified.

The average total time per individual on any kind of psychotropic medication during the time period studied was 66.6 days or 36.6 percent of the period studied. This varied widely in individuals; eight inmates received the drug more than 50 percent and less than 75 percent of the time, while seven inmates received the drug more than four percent and less than 25 percent of the time.

Of the 28 inmates who received some psychotropic medication, 22 showed a greater ratio of aggressive incidents per days on medication than when off medication. For the whole group of aggressive inmates who had received some psychotropic medication the ratio revealed: 66 aggressive incidents per 1866 days on psychotropic medication, as compared to 44 aggressive incidents per 3,230 days not on any psychotropic medication, i.e. a ratio of 3.54. There were therefore 3.54 aggressive incidents per 100 days caused by inmates on psychotropic medication and only 1.36 aggressive incidents per 100 days for those same

inmates when not on any psychotropic medication.

These results are highly significant statistically (p. <.001) with a 250 percent increase in aggressive incident rate while on psychotropic medication. The rate of 1.36 aggressive episodes per 100 days off medication compares favorably with the rate of 1.79 for inmates with an aggressive background who did not receive any psychotropic medication during the period studied. This would be expected because the medication group were off more days than on.

The average number of aggressive incidents for the medication receiving group was 3.92 and 3.26 for the group not receiving medication. The group who did receive some medication were not significantly more aggressive as a group over the whole time period studied, but their acts of aggression were clearly tied to the taking of psychotropic drugs. In both groups the vast majority of incidents were very physically aggressive (i.e. assault, destroying cell to point of kicking down walls, etc.). In the group receiving medication the aggressive incidents were spread throughout the group and the time period. The average length of drug course was 11.4 days, ranging from one to 26 days.

Breaking down the psychotropic medication into drug classes (see Tables 3 and 4) one immediately sees that, except for one case of an antianxiety/antidepressant combination where the rate is almost doubled, any class containing antianxiety agents shows a marked increase in the rate of aggressive incidents. This is most marked in the antianxiety, sedative and hypnotic class, where there is an almost 500 percent increase; when antipsychotics and antianxiety agents are combined, there is a 280 percent increase. This represents an average increase in rate of 360 percent.

For the other classes the average increase in rate is only 200 percent, with a high increase of 230 percent for antipsychotics. This is less than the lowest of the antianxiety classes, excluding the antidepressant combination which may have some sort of dampening effect on the antianxiety agent. Since diazepam accounts for 81.3 percent of the antianxiety group, this group is considered as being chiefly represented by diazepam.

While dividing the groups into two classes is somewhat artificial, the striking increase in aggressive incident rate seen in antianxiety classes shows a significant ($p < .02$ 98 percent level) increase (180 percent) when compared to the aggressive incident rate of the other medication classes combined. Antianxiety drugs are therefore most implicated in causing an increase in aggressive incidents. In some cases the aggressive incident rate doubles as the dosage of antianxiety agents is increased from low to high (see Table 4).

In the antianxiety, sedative and hypnotic classes the rate doubles when either is high as compared to when both are low and doubles again when both are high, to a 500 percent increase over when both are low or an astronomical 1,000 percent increase in aggressive incident rate as compared to no medication. This response was not seen with sedatives and hypnotics alone or when combined with antipsychotics; rather, a decrease in rate was observed when moving from low to high dosage. The combination of sedatives and hypnotics with antianxiety agents may therefore be acting to potentiate the dosage effects of the sedatives and hypnotics. Methyprylon was the sedative and hypnotic prescribed in 69 percent of the cases.

Of the total psychotropic medication used, 70 percent was prescribed by the prison psychiatrist. Due to the psychiatrist's workload, an average wait of nine days existed between psychiatric referral and the actual psychiatric consultation. Even requests from the prison physician for referrals averaged a three day wait. The aggressive incident rate per 100 days during the waiting period from request for consultation to being put on medication was 1.32. This compares with the rate of 1.36 incidents seen for the whole period off medication. This seems to disprove any disclaimer that the aggressive incidents occurred because the inmate was anxious and unable to control his frustrations, or would have been aggressive regardless of drug ingestion, since the inmate was better able to control his aggression *until* he received the psychotropic medication, whereupon the aggressive incident rate almost triples.

Psychotropic medication was often prescribed to prevent recurrence of anxiety or hostility and its use would be cyclic (i.e. two weeks on, one off etc.) extended over a time period. This method of time on and off medication seems to be a rough method of randomizing the usage of psychotropic medication time. The second cycle of time (i.e. second two weeks on) accounted for 26 percent of the total drug days. The aggressive incident rate between periods of medication (i.e. the one week off) was only 0.98. The aggressive act was not therefore just coincidental with the use of psychotropic medication.

Discussion

The prison environment provided several limiting forces not available in a civilian population. It provided a group of known aggressive personalities whose behavior could be easily documented for the period studied. Some environmental control was possible: all subjects were housed within a single building with little variance in food,

TABLE 3

Drug Classes and Rates

Medication	Days	Incidents	Rate Incidents/ 100 Days
None received	3,230	44	1.36
Sedatives and Hypnotics	593	15	2.53
Antipsychotics	221	7	3.17
Anxiolytics	257	10	3.89
Antidepressants	18	0	0.00
Antipsychotics and Anxiolytics	71	3	4.22
Sedatives and Hypnotics and Anxiolytics	309	20	6.44
Antipsychotics and Sedatives and Hypnotics	317	9	2.80
Anxiolytics and Antidepressants	80	2	2.50
TOTALS	5,096	110	

clothing, habitation or routine. The use of psychotropic medication could also be easily and accurately documented and dispensed in a manner which ensured patient compliance.

The prison environment is also one in which aggression is more apt to occur. Aggression is encouraged by the frustrations of limitations in personal expression, restricted space and difficulties in personal and sexual relationships. Also in a prison society violence and aggression are not only socially acceptable but often status gaining; since a captive man is unable to escape his problems and other forms of expression are limited, violent aggression often results. These factors, compounded in a known aggressive personality who in the past has dealt with frustration by violent aggression, provided an excellent testing group for the hypothesis that psychotropic drugs may facilitate this behavior.

The giving of psychotropic medication, especially antianxiety agents, appears to make the acting out of aggression easier, and usually in the violent manner seen in a prison society. Perhaps antianxiety agents do not act to relieve anxiety and the frustration but only to remove the anxiety and inhibitions about aggressive acts.

Considering that certainly not all aggressive personalities are in prison, that frustrations also abound in society and that diazepam is the most commonly prescribed drug in the United States, with chlordiazepoxide third,[5] the implications of the combination of antianxiety agents and aggressiveness are astounding. Further, considering the paucity of information concerning the effects of psychotropic medication on select groups or on the mechanisms of these drugs, more investigation seems mandatory. ◀

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References

1. *ARDREY, R.: The territorial imperative. New York, Dell, 1966.*
2. *ARDREY, R.: The social contract. New York, Dell, 1970.*
3. *AYD, F. J.: Drug studies in prison volunteers, Sth. med. J. 65:440, 1972.*
4. *BLACK, R. (ed).: Drugs and the brain. Baltimore, John Hopkins, 1969.*
5. *BLACKWELL, B.: Psychotropic drugs in use today. J. Amer. med. Ass. 225:13:1637, 1973.*
6. *BURGER, A. (ed).: Drugs affecting the CNS. New York, Dekker, 1968.*
7. *DiMASCICA, SHADER, R. (eds).: Clinical Handbook of Psychopharmacology. New York, Science House. 1970. pp. 161-193.*
8. *DUNLOP, D.: The use and abuse of psychotropic drugs. Proc. R. Soc. Med. 63:1279, 1970.*
9. *EDMUNDSON, N.: Patterns of drug abuse epidemiology in prisoners. Industr. Med. Surg. 41:15, 1972.*
10. *EMERY, F. E.: Freedom and justice within walls, a Bristol prison experiment. London, Tavistock, 1970.*
11. *EVANS, W., KLINE, N. S. (eds).: The Psychopharmacology of the normal human. Springfield, Thomas. 1969.*
12. *GARRATTINI, S., SIGG, F. B. (eds).: Aggressive Behavior. New York, Wiley, 1969.*
13. *JOHNSON, R. N.: Aggression in man and animals. New York, Saunders, 1972.*
14. *LORENZ, K.: On Aggression. New York, Harcourt, 1966.*
15. *LORENZ, K.: Evaluation and modification of behavior. Chicago University, 1965.*
16. *MAGARGEE, E. L., HOKONSON, J. E. (eds).: The dynamics of aggression. New York, Harper, 1970.*
17. *PORTER, R., BIRCH, J.: Chemical influence on behavior. Med. J. Aust. 221:1158, 1972.*
18. *SCOTT, J. P.: Aggression. Chicago University, 1958.*
19. *SCOTT, G. D.: Drugs and reality in a captive society. Can. Psych. Assoc. J. 15:2:215-22, 1970.*
20. *SHADER, R. I., DiMASCIO, A.: Psychotropic drug side effects. Baltimore, Williams, 1970.*
21. *STORR, A.: Human aggression. New York, Atheneum, 1968.*
22. *THOMPSON, T., SCHUSTER, C. R.: Behavioral pharmacology, New Jersey, Prentice, 1968.*
23. *VASSENAR, T.: Psychotropic drugs in the world today, Med. J. Aust. 1: Suppl. 1972.*
24. *WALSTEN HOLME, G., PORTER, R. (eds).: Drug response in man, London, Churchill, 1967.*

TABLE 4

Dosage Breakdown and Rates (Incidents/100 days)

Medication	Days	Incidents	Rates
Anxiolytics			
Low	243	9	3.70
High	14	1	7.14
Sedatives and Hypnotics			
Low	245	8	3.27
High	348	7	2.02
Antipsychotics			
Low	157	7	4.52
High	64	0	
Antidepressants			
Low	18	0	
Anxiolytics, Sedatives and Hypnotics Combined			
Both low	73	2	2.74
AAs low, SHs high	160	10	6.25
AAs high, SHs low	40	3	7.50
Both high	36	5	13.89
AAs low, ADs low	53	1	1.89
AAs low, ADS high	27	1	3.70
Anxiolytics and Antipsychotics Combined			
Both low	69	3	4.35
AAs low, APs high	2	0	
Antipsychotics, Sedatives and Hypnotics Combined			
Both low	175	7	4.00
APs low, SHs high	90	2	2.22
Both high	52	0	